sdsComputation.R

tpeschel

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```
warning = F

source( "~/connection/connection.r" )
```

```
## Loading required package: ROracle
```

```
## Loading required package: DBI
```

```
library( directlabels )
library( dplyr )
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library( gamlss )
```

```
## Loading required package: splines
```

```
## Loading required package: gamlss.data
```

```
## Loading required package: gamlss.dist
```

```
## Loading required package: MASS
```

```
##
## Attaching package: 'MASS'
```

```
## The following object is masked from 'package:dplyr':
##
##     select
```

```
## Loading required package: nlme
```

```
##
## Attaching package: 'nlme'
```

```
## The following object is masked from 'package:dplyr':
##
##     collapse
```

```
## The following object is masked from 'package:directlabels':
##
##     gapply
```

```
## Loading required package: parallel
```

```
##  **********   GAMLSS Version 5.0-1  **********
```

```
## For more on GAMLSS look at http://www.gamlss.org/

## Type gamlssNews() to see new features/changes/bug fixes.
```

```
library( ggplot2 )
library( lifecuration )
```

```
## Loading required package: lubridate

##
## Attaching package: 'lubridate'

## The following object is masked from 'package:base':
##
##     date
```

```
library( lubridate )
library( readxl )
library( reshape2 )
library( svglite )

setwd( "~/LIFE/github-tpeschel/R/ThomasBerger/results/" )

load( "LMS_F0_SPRECH_1_20170328.Rda" )
res.boys.1  <- res.boys
res.girls.1 <- res.girls

load( "LMS_F0_SPRECH_2_20170328.Rda" )
res.boys.2  <- res.boys
res.girls.2 <- res.girls

load( "LMS_F0_SPRECH_3_20170328.Rda" )
res.boys.3  <- res.boys
res.girls.3 <- res.girls

load( "LMS_F0_SPRECH_4_20170328.Rda" )
res.boys.4  <- res.boys
res.girls.4 <- res.girls

persdat     <- get.persdat( ldb )
data.sprech <- get.data.with.aliases( ldb, "T00865", withTabAlias = F )
data.sprech <- add.persdat.age( persdat, data.sprech )
data.sprech <- filter( data.sprech, age < 18 )


sds.normal <-
    function(
        value,
        age,
        sex,
        item,
        ref,
        male   = "male",
        female = "female" ) {
        sapply(
            1 : length( value ),
            function( i ) {
```

```
                mu.col    <- paste( item, sex[ i ], "m", sep = "." )
                sigma.col <- paste( item, sex[ i ], "s", sep = "." )
                if( is.na( value[ i ] ) | is.na( age[ i ] ) | is.na( sex[ i ] ) )
                    return( NA )
                m <- approx( ref$age, ref[ ,mu.col ],    xout = age[ i ], rule = 1 )$y
                s <- approx( ref$age, ref[ ,sigma.col ], xout = age[ i ], rule = 1 )$y
                ( value[ i ] - m ) / s
            }
        )
    }

sds.bccg <-
    function(
        value,
        age,
        sex,
        item,
        ref,
        male   = "male",
        female = "female" ) {
        sapply(
            1 : length( value ),
            function( i ) {
                mu.col    <- paste( item, sex[ i ], "m", sep = "." )
                sigma.col <- paste( item, sex[ i ], "s", sep = "." )
                lamda.col <- paste( item, sex[ i ], "l", sep = "." )
                if( is.na( value[ i ] ) | is.na( age[ i ] ) | is.na( sex[ i ] ) )
                    return( NA )
                m <- approx( ref$age, ref[ , mu.col ],    xout = age[ i ], rule = 1 )$y
                l <- approx( ref$age, ref[ , lamda.col ], xout = age[ i ], rule = 1 )$y
                s <- approx( ref$age, ref[ , sigma.col ], xout = age[ i ], rule = 1 )$y
                ( ( value[ i ] / m ) ** l - 1 ) / ( l * s )
            }
        )
    }

refs <-
    data.frame(
        age = res.girls[[ 1 ]]$age,

        sprech1.male.m   = rowMeans( Reduce( bind_cols, lapply( res.boys.1,  function( x ) data.frame( m
        sprech1.male.s   = rowMeans( Reduce( bind_cols, lapply( res.boys.1,  function( x ) data.frame( s
        sprech1.male.l   = rowMeans( Reduce( bind_cols, lapply( res.boys.1,  function( x ) data.frame( l
        sprech1.female.m = rowMeans( Reduce( bind_cols, lapply( res.girls.1, function( x ) data.frame( m
        sprech1.female.s = rowMeans( Reduce( bind_cols, lapply( res.girls.1, function( x ) data.frame( s
        sprech1.female.l = rowMeans( Reduce( bind_cols, lapply( res.girls.1, function( x ) data.frame( l

        sprech2.male.m   = rowMeans( Reduce( bind_cols, lapply( res.boys.2,  function( x ) data.frame( m
        sprech2.male.s   = rowMeans( Reduce( bind_cols, lapply( res.boys.2,  function( x ) data.frame( s
        sprech2.male.l   = rowMeans( Reduce( bind_cols, lapply( res.boys.2,  function( x ) data.frame( l
        sprech2.female.m = rowMeans( Reduce( bind_cols, lapply( res.girls.2, function( x ) data.frame( m
        sprech2.female.s = rowMeans( Reduce( bind_cols, lapply( res.girls.2, function( x ) data.frame( s
        sprech2.female.l = rowMeans( Reduce( bind_cols, lapply( res.girls.2, function( x ) data.frame( l
```

```
        sprech3.male.m   = rowMeans( Reduce( bind_cols, lapply( res.boys.3,  function( x ) data.frame( m
        sprech3.male.s   = rowMeans( Reduce( bind_cols, lapply( res.boys.3,  function( x ) data.frame( s
        sprech3.male.l   = rowMeans( Reduce( bind_cols, lapply( res.boys.3,  function( x ) data.frame( l
        sprech3.female.m = rowMeans( Reduce( bind_cols, lapply( res.girls.3, function( x ) data.frame( m
        sprech3.female.s = rowMeans( Reduce( bind_cols, lapply( res.girls.3, function( x ) data.frame( s
        sprech3.female.l = rowMeans( Reduce( bind_cols, lapply( res.girls.3, function( x ) data.frame( l

        sprech4.male.m   = rowMeans( Reduce( bind_cols, lapply( res.boys.4, function( x ) data.frame( mu
        sprech4.male.s   = rowMeans( Reduce( bind_cols, lapply( res.boys.4, function( x ) data.frame( si
        sprech4.male.l   = 1,
        sprech4.female.m = rowMeans( Reduce( bind_cols, lapply( res.girls.4, function( x ) data.frame( m
        sprech4.female.s = rowMeans( Reduce( bind_cols, lapply( res.girls.4, function( x ) data.frame( s
        sprech4.female.l = 1
    )

data.sprech$sprech1_sds <-
    sds.bccg(
        value  = data.sprech$F0_SPRECH_1,
        age    = data.sprech$age,
        sex    = data.sprech$sex,
        item   = "sprech1",
        male   = "male",  ## unnoetig weil default
        female = "female", ## unnoetig weil default
        ref    = refs[ ,c( "age", "sprech1.male.m", "sprech1.male.s", "sprech1.male.l", "sprech1.female

data.sprech$sprech2_sds <-
    sds.bccg(
        value  = data.sprech$F0_SPRECH_2,
        age    = data.sprech$age,
        sex    = data.sprech$sex,
        item   = "sprech2",
        male   = "male",  ## unnoetig weil default
        female = "female", ## unnoetig weil default
        ref    = refs[ ,c( "age", "sprech2.male.m", "sprech2.male.s", "sprech2.male.l", "sprech2.female

data.sprech$sprech3_sds <-
    sds.bccg(
        value  = data.sprech$F0_SPRECH_3,
        age    = data.sprech$age,
        sex    = data.sprech$sex,
        item   = "sprech3",
        male   = "male",  ## unnoetig weil default
        female = "female", ## unnoetig weil default
        ref    = refs[ ,c( "age", "sprech3.male.m", "sprech3.male.s", "sprech3.male.l", "sprech3.female

data.sprech$sprech4_sds <-
    sds.normal(
        value  = data.sprech$F0_SPRECH_4,
        age    = data.sprech$age,
        sex    = data.sprech$sex,
        item   = "sprech4",
        male   = "male",  ## unnoetig weil default
        female = "female", ## unnoetig weil default
```

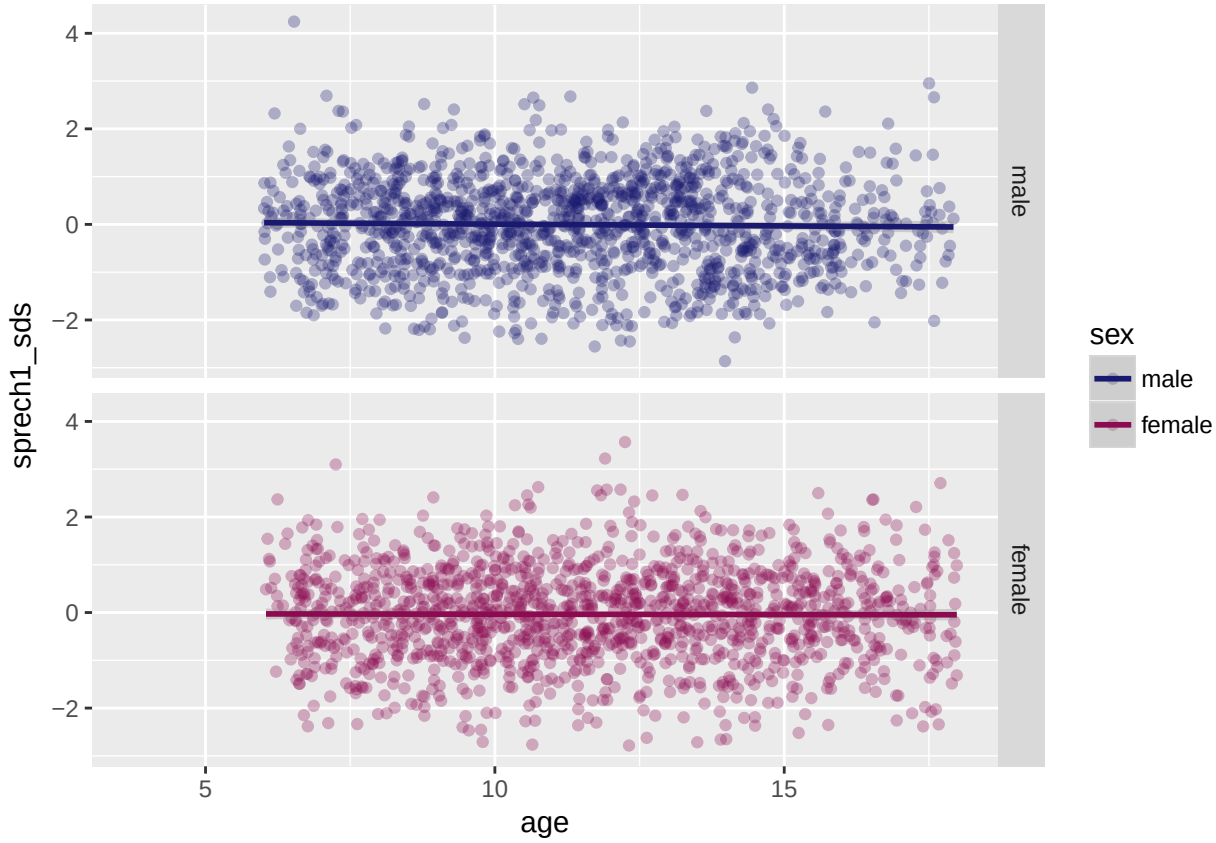
```
        ref    = refs[ ,c( "age", "sprech4.male.m", "sprech4.male.s", "sprech4.male.l", "sprech4.female
```

```
data.sprech$year <- year( data.sprech$EDAT )

sozdem <- get.data( ldb, "D00177", remove.D.name = T )

data.sprech <-
    merge(
        data.sprech,
        sozdem,
        by.x = c( "SIC", "year" ),
        by.y = c( "SIC", "JAHR" ) )

ggplot( data.sprech,
    aes( age, sprech1_sds, col = sex ) ) +
    geom_point( alpha = .3, na.rm = T ) +
    geom_smooth( method = "gam", na.rm = T ) +
    facet_grid( sex ~ . ) +
    scale_color_manual( values =  c( "male" = "midnightblue", "female" = "deeppink4" ) )
```

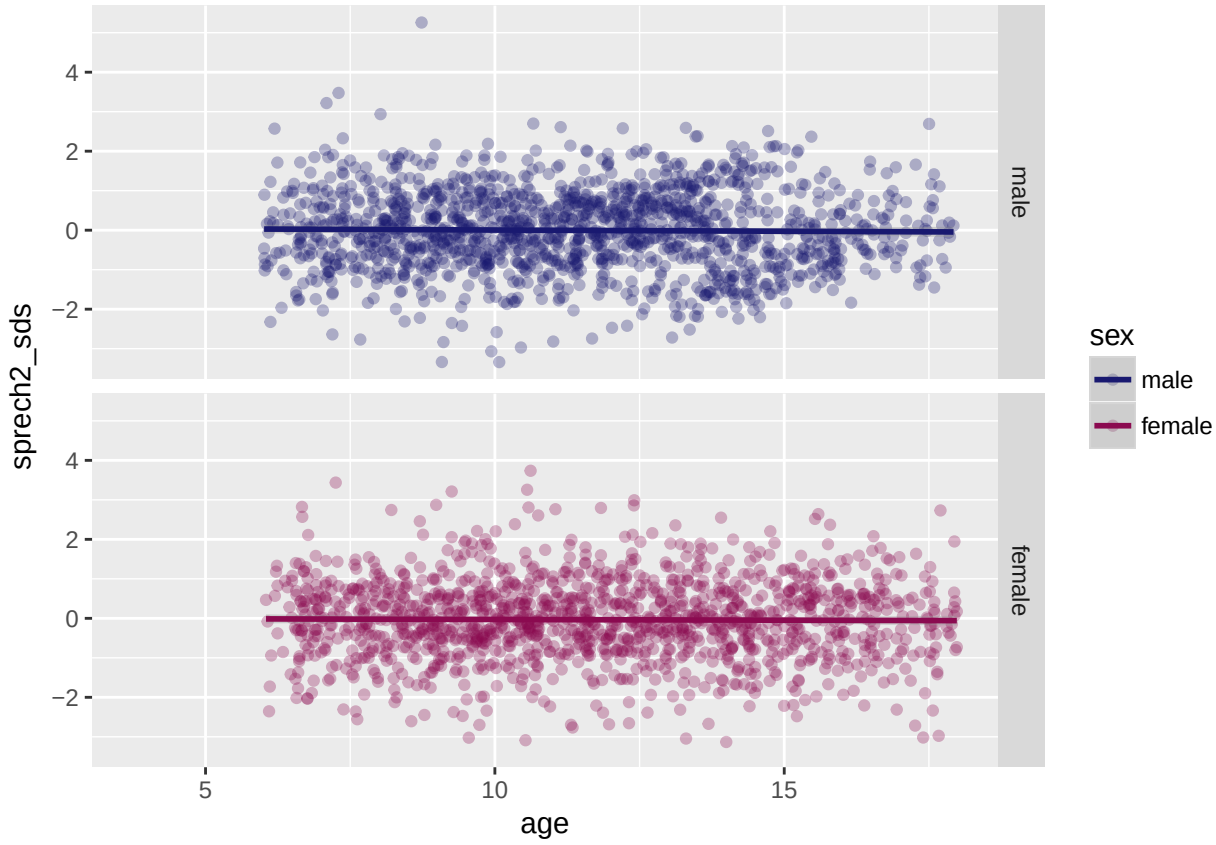



```
ggsave( "sprech1_sds.png" )
```

```
## Saving 6.5 x 4.5 in image
```

```
ggplot( data.sprech,
    aes( age, sprech2_sds, col = sex ) ) +
    geom_point( alpha = .3, na.rm = T ) +
```

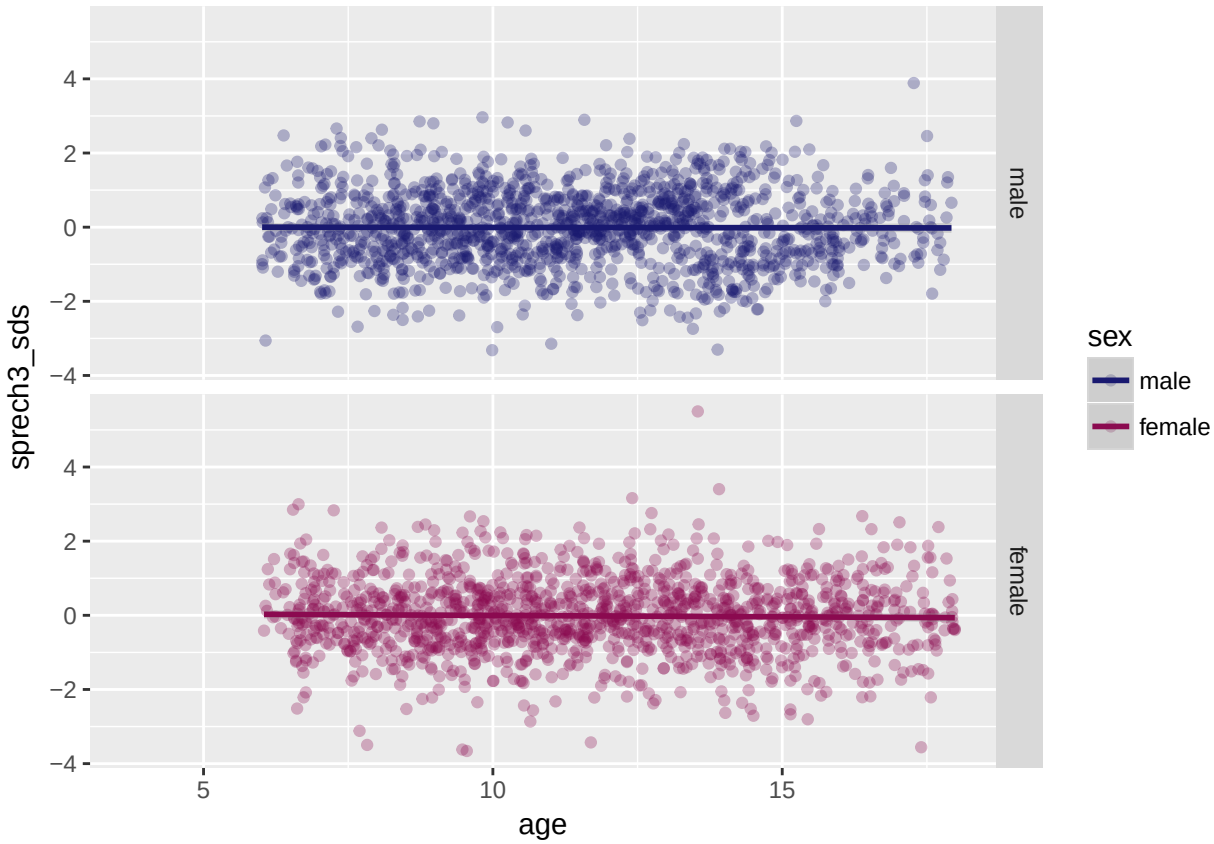
```
    geom_smooth( method = "gam", na.rm = T ) +
    facet_grid( sex ~ . ) +
    scale_color_manual( values =  c( "male" = "midnightblue", "female" = "deeppink4" ) )
```




```
ggsave( "sprech2_sds.png" )
```

```
## Saving 6.5 x 4.5 in image
```

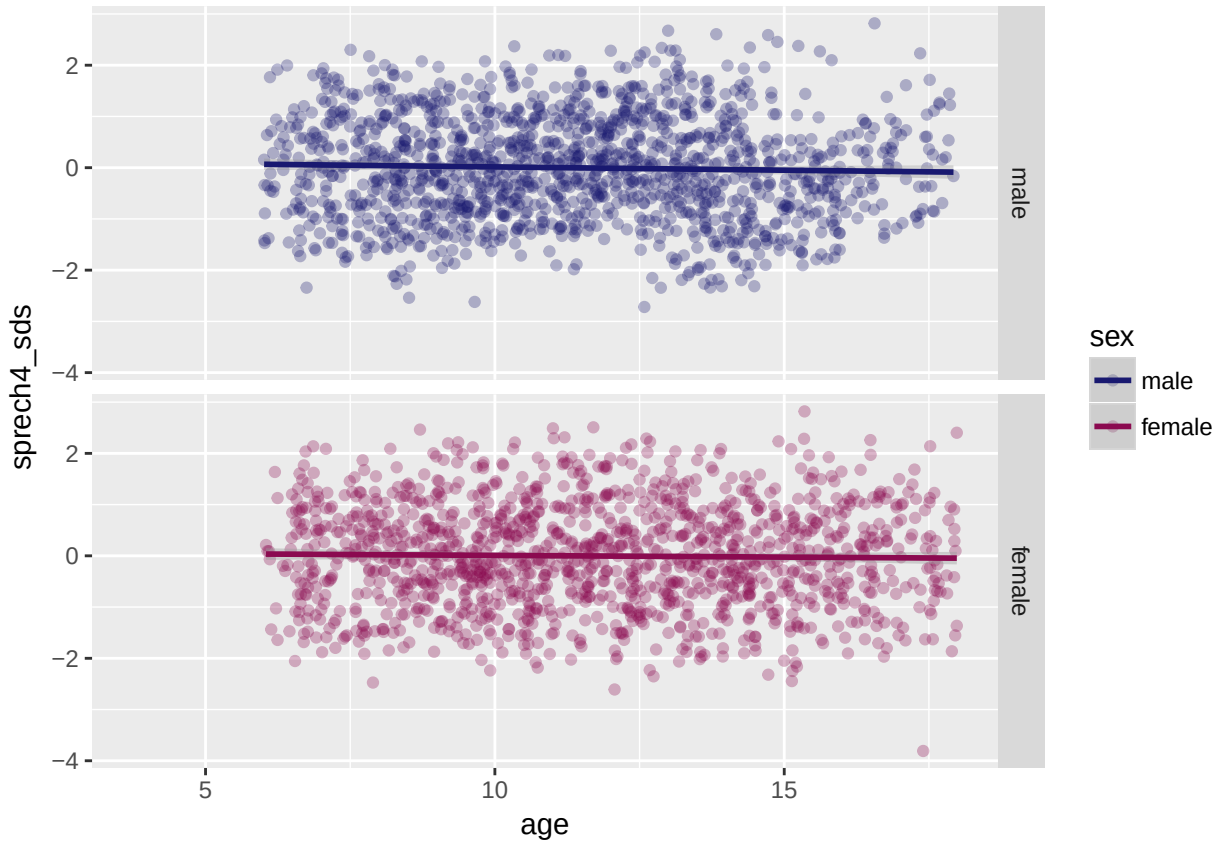
```
ggplot( data.sprech,
    aes( age, sprech3_sds, col = sex ) ) +
    geom_point( alpha = .3, na.rm = T ) +
    geom_smooth( method = "gam", na.rm = T ) +
    facet_grid( sex ~ . ) +
    scale_color_manual( values =  c( "male" = "midnightblue", "female" = "deeppink4" ) )
```




```
ggsave( "sprech3_sds.png" )
```

```
## Saving 6.5 x 4.5 in image
```

```
ggplot( data.sprech,
    aes( age, sprech4_sds, col = sex ) ) +
    geom_point( alpha = .3, na.rm = T ) +
    geom_smooth( method = "gam", na.rm = T ) +
    facet_grid( sex ~ . ) +
    scale_color_manual( values =  c( "male" = "midnightblue", "female" = "deeppink4" ) )
```




```
ggsave( "sprech4_sds.png" )
```

```
## Saving 6.5 x 4.5 in image
```

```
save( refs, file = "refs.Rda" )
save( data.sprech, file = "data.sprech.Rda" )
```